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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/620,968

07/20/2000

Shunpei Yamazaki

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4214

22204

7590

10/23/2006

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EXAMINER

HA, NATHAN W

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 10/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/620,968	YAMAZAKI, SHUNPEI	
	<b>Examiner</b>	<b>Art Unit</b>	
	Nathan W. Ha	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 2-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2-3, 5-6, 9-10, 12-13, 16, and 19-20, and 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue (US 4,976,839, previously cited).

In regard to claims 2, 5, 9, 12, 16, and 19, in figs. 3-7, Inoue discloses a method for manufacturing a semiconductor device comprising the steps of:

forming an insulating film 12 of silicon nitride over a semiconductor substrate 11 by sputtering in a chamber with an atmosphere comprising gases including nitrogen of 50-75% of the gases. See col. 6, lines 15-50 and claim 4.

It appears that the Inoue teaches the range of the nitrogen volume is 50-75%, with touches the range as claimed, 75%. But this range may be modified in the chamber in order to adjust the total volume of the gases in the room depending on the layer's property that need to meet the requirements and to improve certain device's characteristics.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to realize that the modification of the volume of the

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nitrogen is obvious in order to adjust the layer's characteristics and the chamber's condition.

The electrode is made of aluminum. See col. 6, lines 50-51.

In regard to claims 26-31, as mentioned, the targeting layer is silicon nitride layer.

3. In regard to claims 3, 6, 10, 13, 17, and 20 the sputtering is RF sputtering, or plasma. See fig. 1 and col. 6, lines 46-50.

4. Claims 4, 7, 11, 14, 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue as applied to claims 2-3, 5-6, 10, 12-13, 16, and 20 above, and further in view of Nomoto et al. (US 5,225,364, previously cited, hereinafter Nomoto.)

In regard to claims 4, 7, 11, 14, 18 and 21 Inoue discloses all of the claimed limitations as mentioned above and mentions the applications of thin films of refractory metal nitride (see the front fact of the patent) except expressly teaches the device can be used in a matrix display. It is noted that the device of Cunningham in fact can be used in a matrix display device since it is a metallization device. It is used to carry out signal or power connection. However, in order to show the obviousness of this utility, Nomoto is incorporated herein. Nomoto discloses an analogous semiconductor device with substrate 1, silicon nitride insulating layer 5 and an aluminum electrode 8. The matrix has plurality devices that connect in rows and columns. Therefore, it is proper to combine this structure to a metallization structure in order to carry out the intended product, or design choice of a product.

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Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to adapt matrix device as taught by Nomoto in Inoue's in order to carry out the advantage mentioned above.

5. Claims 8, 15, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue as applied to claims 2-3, 5-6, 10, 12-13, 16, and 20 above, and further in view of Yamazaki et al. (US 6,586,346, previously cited, herein, Yamazaki.)

In regard to claims 8, 15, and 22-25, the above combination discloses all of the claimed limitations except the volumes of argon and halogen, fluorine, see the abstract. Yamazaki discloses an analogous process and further includes the volumes of the argon and halogen as claimed in claims 5, 8, 15, and 22 in order to prevent fixed electric charges from being generated in the film (see the abstract.)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use appropriate volumes of the argon and halogen materials in order to prevent fixed electric charges from being generated in the film.

### ***Response to Arguments***

6. Applicant's arguments filed 8/31/06 have been fully considered but they are not persuasive. For instance, the Applicants contend that the cited reference, Inoue, does not teach certain claimed limitations, for example, the semiconductor layer is formed by sputtering in an atmosphere comprising nitrogen at 75% volume or more. As mentioned above, Inoue discloses the volume of the nitrogen is about 75%. Even though Inoue does not specifically teach the volume of nitrogen could be more than 75%, but this

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number can be varied as a routine during the process of forming the layer in order to meet certain requirements depending on the utility of the layer. Thus, it is obvious to one of ordinary skill in the art to routinely adjust the volume of the nitrogen in the chamber in order to improve the layer's characteristics such as modifying the layer's dielectric constant.

### ***Conclusion***

**7. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

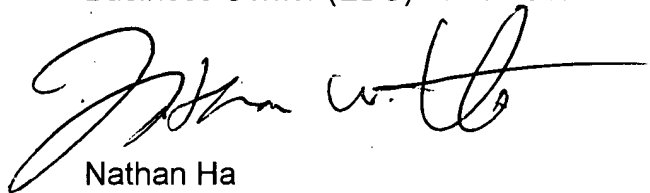
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan W. Ha whose telephone number is (571) 272-1707. The examiner can normally be reached on M-TH 8:00-7:00(EST).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Nathan Ha', with a long horizontal flourish extending to the right.

Nathan Ha  
Primary Examiner  
October 11, 2006